

C. S. Matthews.



NORTH CAROLINA

A Land of Opportunity

in
**Fruit Growing,
Farming and Trucking.**



DEPARTMENT of AGRICULTURE
Raleigh.

NORTH CAROLINA DEPARTMENT OF AGRICULTURE,

RALEIGH, N. C.

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Collects and disseminates information about the State.
Studies all phases of its agriculture, horticulture, etc.
Issues monthly bulletins from results of investigations.
Conducts test farms and test acres in various parts of the State.
Controls infectious diseases of domestic animals.
Investigates diseases of plants, trees, etc.
Conducts quarantine for the suppression of splenic fever.
Investigates ravages of insects and inspects nurseries.
Inspects fertilizers, guaranteeing protection to purchasers.
Inspects and analyzes foods, feeds, seeds, condimental feeds, soils, waters, minerals, and illuminating oils.
Identifies specimens of minerals, plants, and animals.
Conducts Farmers' Institutes for men and women.
Conducts soil survey.
Manufactures hog-cholera serum.
Assists in dairy work and in the building of barns and silos.
Gives demonstrations in spraying, pruning, and in the packing of fruit and vegetables.
Tests the viability and purity of seed.
Conducts tobacco experimental farms.
Experiments in all sections to find the adaptability of certain varieties and crops to certain soils, also to find the elements of fertilizers most necessary and the best method of culture of each crop in the different localities.
Conducts Boys' Corn Clubs.
Assists in judging stock and farm products at the various fairs.
Maintains a Museum of resources and natural history.
Write for information.

NORTH CAROLINA

CONDITIONS CONDUCTIVE TO

FARMING, TRUCKING,

FRUIT GROWING,

STOCK RAISING, ETC.

IN THE

OLD NORTH STATE

WRITE THE
NORTH CAROLINA DEPARTMENT OF AGRICULTURE
FOR INFORMATION REGARDING ANY PARTICULAR
SECTION OR INDUSTRY



TIDEWATER
NORTH CAROLINA.

AGRICULTURE.

MARKETS.

THE greatest asset of any agricultural community is a good local market. There was a time when the North Carolina farmer looked in vain for a home market, but that time has passed. In respect to local markets, North Carolina is unexcelled and rarely equaled by any State in the Union.

We have no great city like Atlanta or Philadelphia, but we do have a large number of smaller thriving cities—Asheville, Gastonia, Charlotte, Winston, Salisbury, Greensboro, Monroe, Durham, Raleigh, Wilmington, Goldsboro, New Bern, Wilson, Rocky Mount, Tarboro, Kinston, Greenville, Henderson, High Point, Elizabeth City, Fayetteville, and a number of others ranging in population from 3,000 to 30,000 and scattered broadcast over the entire State. It would be practically impossible for a farmer to locate in North Carolina and not be in easy reach of some good local market.

There was a time when no one seemed to care for anything we had to sell, but economic conditions have so changed that nothing short of a National calamity is likely to reduce the present demand for the products of the North Carolina farm. The day is fast approaching when the North Carolina farmer will need to look nowhere outside the State for markets for his staple products. This statement can hardly be called prophetic when we note the phenomenal increase in the number of manufactures of every kind within our borders and the large towns and consequent good markets that necessarily attend these manufacturing enterprises. New England is coming South with her mills and markets.

These industries are constantly calling for more labor, and since only white labor is wanted, a large percentage of the white families that were on the farm twenty years ago are now working in the mills. The former producers of farm products have been transformed into consumers of farm products and producers of finished mill products. In other words, the mills have collected men, women, and children from large extents of territory and thus made good markets for those of the rural population who have preferred to stay on the farm. It is needless to say these towns are rapidly growing larger and new ones are yearly being built.

When we come to think of North Carolina as having a population of hundreds of thousands more than Kansas, Nebraska, South Carolina, Tennessee, Alabama, or Mississippi, and more than the States of Colorado, Nevada, Idaho, Montana, Wyoming, Vermont, and Delaware combined, with a very large percentage of this in the different manufacturing towns, it should emphasize the importance of our local markets.

TRANSPORTATION.

RAILROADS.

No State in the South has better transportation facilities. Five great railroad systems are rushing through the State to reach deep water of the Atlantic Coast, there to connect with steamers for the Panama Canal when completed. Besides these, there are over forty other short lines and feeders that ramify the State like so many blood vessels in our great industrial system. Every farmer is thus put in direct touch with a good home market and is but a few hours from Charleston, Atlanta, Memphis, Chattanooga, St. Louis, Chicago, Pittsburgh, Richmond, Washington, Baltimore, Philadelphia, New York, and Boston.

COUNTRY ROADS.

In addition to our superb railway facilities, there was launched some years ago a general movement for better country roads in North Carolina. As a result of that movement there is hardly a county in the State to-day which has not built or is not contemplating the building of good macadam or sand-clay roads leading from the county-seat or principal town in the county into the remotest agricultural districts. These main lines of good roads have secondary roads leading into them which are also graded and made good. In a word, both the railroad and dirt road transportation facilities in North Carolina are simply unsurpassed by any State in the South and hardly equaled by any State in the Union.

TELEPHONE SYSTEM.

In addition to our superb transportation facilities, rural telephones are found everywhere, thus putting the farmer in immediate communication with the markets in his locality at a cost ranging from 50 cents to \$1 per month.

PUBLIC SCHOOL SYSTEM.

A volume could be written on North Carolina's splendid public school system; suffice it to say here, however, that good public school buildings are located in every county and that every farmer has first-class free school facilities right at his door.

RECENT GROWTH.

The foundations for a strong, progressive, agricultural and manufacturing State were laid by nature in the topography, soils, climate, and people of North Carolina. Some of the best land, unsurpassed water-power, and an ideal climate have existed for ages in Africa, but the absence of people capable of utilizing them has allowed that vast continent to remain a fertile field for the explorer.

We have the water-power in North Carolina and we are developing it; we have the good lands, and we are making use of them; we have the equable climate, and its influence is shown in the general health and vigor of our people.

The three and a half million horse-power found along our streams is being harnessed, and not only are our cities lighted, our street cars and over eighty of our large cotton mills run by this hydro-electric power, but even the cobbler in his shop uses this water-generated electricity as a beast of burden.

Perhaps a better insight may be had into the real conditions existing in North Carolina from the following:

During the last thirty-six years—half the lifetime of a man—land values in North Carolina have increased over \$109,000,000. City real estate has increased \$101,000,000. Personal property has increased \$134,000,000. It will thus be seen that the increase of land values in the State during this thirty-six-year period has been at the rate of \$3,000,000 per annum. The value of all property in the State during this thirty-six-year period has increased \$468,000,000, which is an increase of \$16,000,000 per annum. During the last ten years the value of land has increased over \$6,000,000 per annum, and during the last five years nearly \$7,000,000 per annum throughout the State. It is found that the increase in value of all property in the State during the last five years has been at the rate of \$26,000,000 per annum. In 1873 land values were over \$56,000,000 more than city real estate values. In 1900 land values were but \$55,000,000 more than city real estate values. This shows a gradual increase in the value of city property over the value of land. It will be seen that the two values are remaining close to each other, however, with a slight increase in favor of the city real estate, due to the increase of manufacturing enterprises.

During the twenty-year period prior to 1900 there were built an average of three cotton mills per annum. In 1910 North Carolina had 331 cotton mills, whereas in 1900 she had but 177. This shows that there were over fifteen cotton mills built per annum during the last ten years. There are now about 750 factories in the State other than cotton factories.

From the above it is easy to see that North Carolina is rapidly coming to be a leading manufacturing State, with all the demands made by such a State upon the crop-producing capacity of its agricultural districts.

LABOR.

In North Carolina a competence, if not a fortune, awaits the man, especially the farmer, who is willing to work. You frequently hear the cry of scarcity of labor, but this cry is generally set up by a man who has been accustomed to use one man for every horse on the farm. With the old methods of farm practice the labor problem is in some cases, no doubt, a serious one; but the time is rapidly approaching when there is going to be a revolution in agricultural methods in this State. Every condition invites this revolution. Our fields are broad and in most cases sufficiently level to permit the use of improved machinery, whereby one

man may become as effective as three or four are at present. Indeed, it is one of the most hopeful signs in favor of North Carolina agriculture that many of the most progressive farmers are installing improved machinery, and it is significant that where farmers have introduced improved machinery, labor is not so hard to command. The laborers are forcing the landowners to adopt new methods, greatly to the benefit of both. This is parallel with the recent labor problem in the corn States where the huskers refused to work until the farmers bought portable elevators by which the ears could easily be lifted into the crib. Not only in North Carolina, but in every agricultural section in the country, if the farmer hopes to command his labor he must make the work easier for his men, because it is man's disposition to seek employment where the labor is least irksome and wages are highest. Moreover, by the installation of improved machinery the farmer can so increase the efficiency of his workmen as to be able to pay them such wages as will attract them to his farm.

SOILS.

North Carolina has a great variety of soils. Indeed, a good soil type may be found in North Carolina for almost any kind of farming one might want to follow in this latitude.

If one desires to raise cattle or go into the dairy business, the Porter's and Toxaway soils of the mountains offer unusual inducements. Here one finds soils suited to grass and clover, and wide pastures may be had with ease, off of which fat cattle are sent direct to the slaughter-houses. This section also supplies the farmers of the rest of the State with feeders when these farmers are disposed to feed cattle for a few months in order to clean up a lot of cheap forage and to market their surplus corn and cotton-seed meal. Dairying and cattle raising are being developed in the piedmont section, also, where the red clay soils of the Cecil series produce good crops of wheat, corn, clover, and grass, and where the local markets for cattle and dairy products are unusually good.

In case corn growing and general farming is preferred, piedmont North Carolina is unsurpassed in the South. Here the Cecil and Meeklenburg series of soils produce the best of wheat, corn, and clover and are of such contour as to permit the use of the latest improved farm machinery. Good corn, wheat, and oats can be grown on the heavy soils further east; but this is the recognized wheat, corn, and clover section of the State.

If cotton is to be made the money crop, there are no better soils in this latitude for this plant than are found in Robeson, Scotland, and other counties in southeast North Carolina. These soils are of the Orangeburg and Norfolk types, the former of which is the best upland cotton soil in the South. Good cotton is grown also on the sandier members of the Cecil series. The above-named soils are especially mentioned because cotton seems to do its best on them. But very good

yields of cotton are gathered each year from even the heavy clay soils in the southeast and southern part of the State, where the climate suits the crop best.

The Norfolk series of soils in the extreme eastern and northeastern part of the State are especially adapted to the production of the peanut. Here thousands of acres are planted in peanuts every year. Halifax, Bertie, Chowan, Perquimans, Edgecombe, Washington, Martin, etc., are noted for the production of large crops of the different varieties of peanuts.

Both the soils and climate of the extreme eastern part of North Carolina are especially suited to trucking. The soils especially suited to the strawberry, celery, onion, lettuce, and potato are of dark color and belong to the Portsmouth series. Chadbourn, N. C., is said to ship more strawberries than any other point in the world. Here the berries are grown almost entirely on the dark, moist soils of the Portsmouth series. All along the coast from Southport to Norfolk are found excellent soils adapted to the production of almost all kinds of early truck suitable for the northern markets. While the trucking business is already developed to a very high degree on these soils, there are thousands of acres that are yet uncultivated, but may be purchased for a nominal sum.

We generally think of the Porter's series of soils in the west as the apple soils, and the sand-hill portion of the Norfolk series of soils in the east as the peach soils of the State. While both peaches and apples are grown more or less on all the soils in the State, most of the large commercial orchards are located on one or the other of these two soil series.

The bright tobacco belt of the State is located on the Durham and Norfolk series of soils. This belt includes Rockingham, Person, Granville, Caswell, Pitt, Edgecombe, and parts of other counties in the north central section of the State. Here the bright tobacco industry is quite well developed locally, but large areas of choice tobacco land is either not farmed at all or planted in some less remunerative crop. The heavy shipping types of tobacco can be most successfully grown on the heavy soils, notably in the far western part of the State. However, in piedmont North Carolina, on the red clay lands of the Cecil series and Mecklenburg series, this heavy tobacco may be grown also.

Perhaps the best corn soils in the world are found in Hyde, Beaufort, Washington, and other coast counties. These are deep, black, peaty soils, which when drained produce very large yields of corn for years in succession. The drainage of these rich lands is generally quite feasible and large areas are now under the ditch and are being farmed with great profit. The soja bean is also at home in this type of soil—this section being thought of as the corn and soja-bean section of the State.

When the soils become acid, as they may in the course of time, they may be easily marled or lined from marl beds that underlie that part

of the State pretty generally. This marl not only has the usual power to correct acid, but carries also an appreciable amount of potash and phosphorus which adds to the mineral plant-food supply in the surface soil. These black soils belong to the Portsmouth series, which are everywhere recognized as strong corn lands when properly drained.

CROPS.

COTTON.

The cotton crop is not only one of the most valuable in the State, ranging in value between \$50,000,000 and \$60,000,000 per annum, but it is a notable fact that the average yield per acre in the State is greater than that of Georgia, Alabama, Mississippi, or Texas.

The type of cotton best suited, at present, to all but the extreme southeastern part of the State is known as the King type of cotton, of which there are a number of varieties. Other types of cotton outyield the King some seasons, but our seasons are rather short for the big balled cottons and those that make a big yield from the "top crop" late in summer. It is always safe, therefore, to use the cotton that has been developed in this latitude and is adapted to our short seasons.

But the King type yields splendidly under proper conditions of cultivation and fertilization. The cut on opposite page shows a field of this type that made $3\frac{1}{2}$ bales to the acre last year. At prices then prevailing, this yield would bring a gross return in seed and lint of \$315 an acre. The average cotton yield per acre in the State is very much below $3\frac{1}{2}$ bales, but good yields are always obtained where sane methods of production are followed.

The cotton plant needs humus or vegetable matter in abundance and a liberal application of phosphate. The first can be gotten easily by plowing under green crops, such as soy beans, crimson clover, rye, etc., the year previous. Stable manure is unexcelled as far as it goes, but we do not have enough to affect any extensive areas. Green crops can always be brought into service and the lands thus made rich in organic matter in the absence of the desired number of live stock. Phosphate can be obtained either from phosphoric acid or floats, the latter of which is relatively cheap. There are other sources of phosphate which are, however, more expensive. The floats should always be mixed with stable manure and composted for a few months or applied with green crops plowed under.

Notwithstanding we are on the northern limit of the cotton belt, a large amount of this staple crop is produced every year—indeed, we have a few counties that are unexcelled in cotton production. Last year it was said that Robeson County, one of the largest in the State, produced a bale of cotton to every man, woman, and child in it.

Many of the truckers get a sort of double profit from their fertilizers by following early truck with cotton, which is planted between the rows of truck, notably, Irish potatoes, English peas, or radishes, before the truck crop is harvested.



COTTON FIELD AT PICKING TIME.

WHEAT.

Wheat is rapidly gaining in importance as a staple crop in North Carolina. We have most excellent wheat lands in the State, but on account of low prices of all farm products, until comparatively recently, the wheat crop has not been pushed, cotton having largely taken its place even on the best wheat lands in the State.

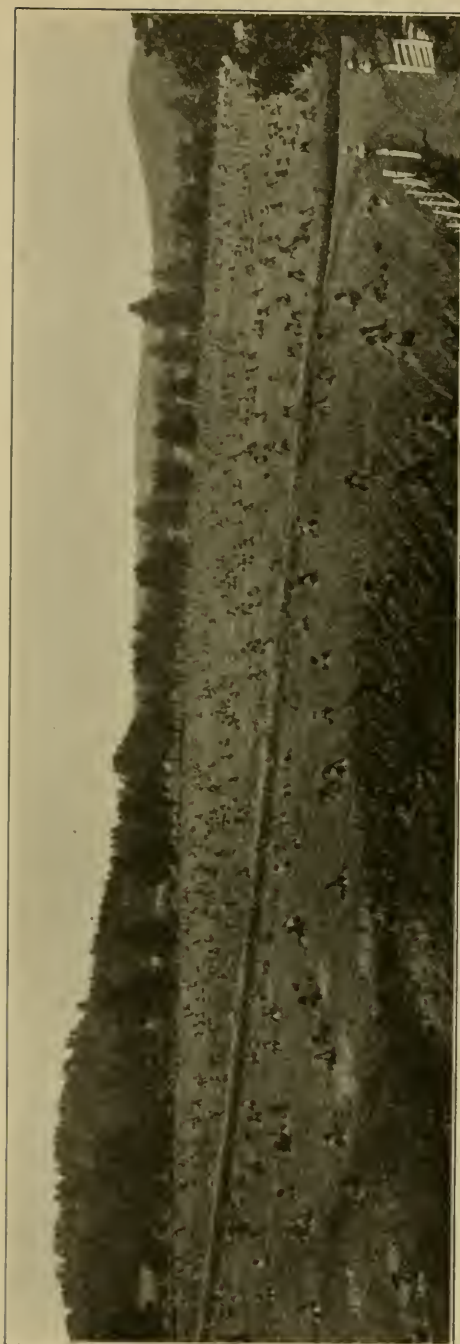
We can grow wheat and in large amounts. Every man recalls, as a schoolboy, to have had his especial attention called to California on account of its phenomenal yields of wheat, sometimes as high as 50 bushels to the acre having been reported. It is interesting to note that while the wheat crop of California has always been good, the average yield in that State has frequently fallen below the average yield in North Carolina. There have been as large yields of wheat obtained in this as perhaps almost any State in the Union—not yields from individual acres, but from whole farms. There is a large farm in Halifax County on which there were grown last year an average of 28½ bushels per acre on a 140-acre field. In Johnston County, a gentleman grew an average of 42 bushels per acre on a 50-acre field, with individual acres running as high as 50 bushels. In Randolph County, a gentleman grew last year an average of 27 bushels per acre on a 40-acre field. In Davidson County, a farmer grew an average of over 30 bushels per acre on a 130-acre tract. But we need not multiply examples. Suffice it to say that these yields were gotten by practice of common-sense methods on lands adapted by nature or by preparation to the growth of wheat. These yields may be duplicated by any farmer who has good heavy clay loam or silt loam soil and is willing to treat it properly. Further instructions for the handling of these wheat lands may be obtained from the Department of Agriculture on request.

CORN.

Corn grows in all parts of the State. It is our leading crop and the yield is yearly increasing. It will be interesting to note that in 1910 the corn crop of North Carolina was more valuable than the corn crop of either Wisconsin, Michigan, New York, Pennsylvania, Virginia, West Virginia, South Carolina, Mississippi, Arkansas, or Louisiana, and worth considerably more than half as much as that of the States of Nebraska, Kansas, Indiana, or Ohio.

Our genial climate, long growing season, and the rapidity with which the plant foods become available in the soils of the State throughout the year, all combine to make this crop one of especial importance both in point of yield and ease of production.

The demand for corn is very great in North Carolina. Notwithstanding we have increased the yields of corn from 29,790,180 bushels in 1900 to 57,132,000 in 1910, there are still millions of bushels shipped into the State from the West each year to supply the ever-increasing demand for this cereal.

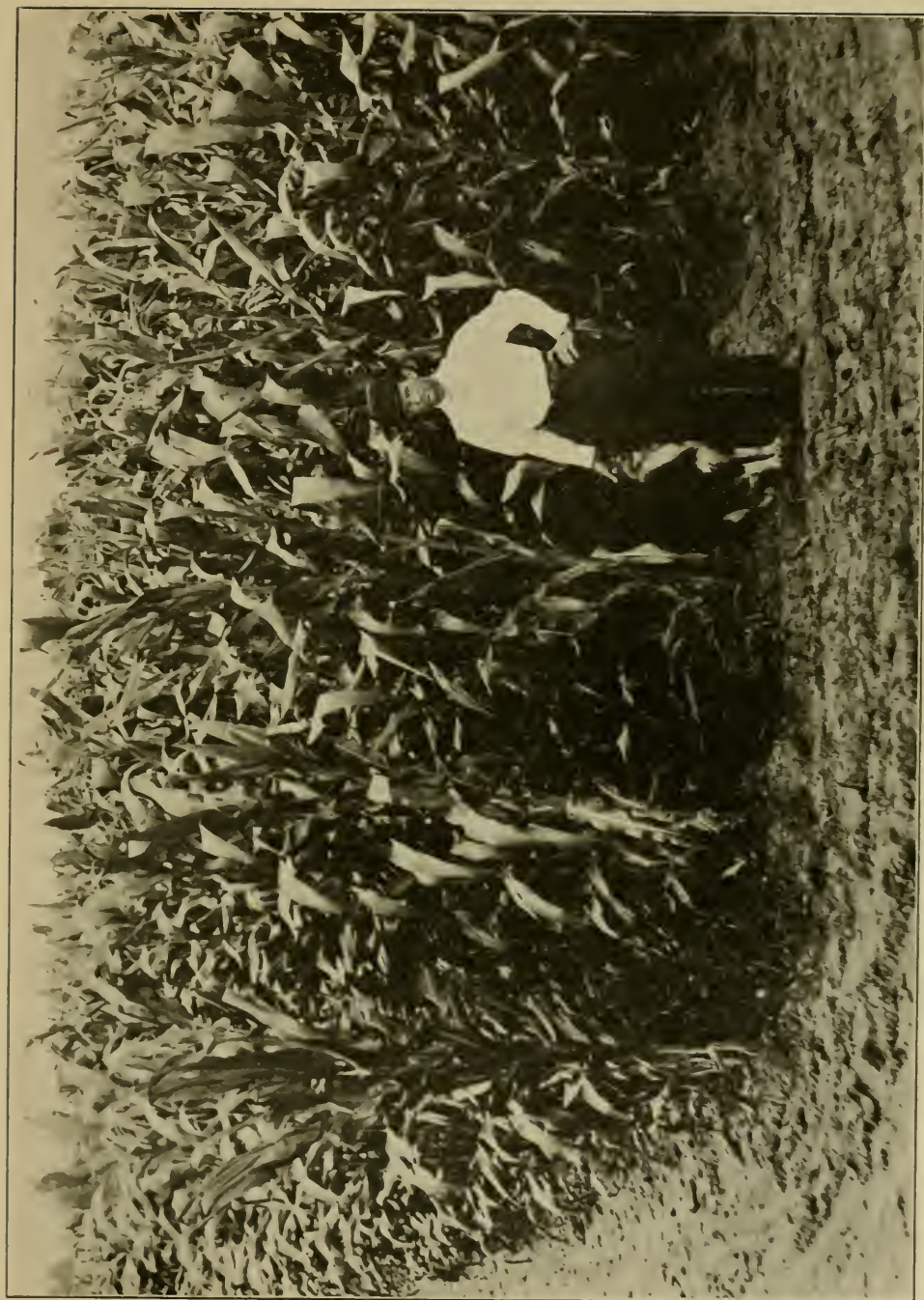


WHEAT FIELD, PIEDMONT SECTION OF NORTH CAROLINA.

There are no better corn soils in the United States than are found in Hyde, Beaufort, Washington, and other counties along the Atlantic Coast. These are deep, black, peaty soils that have been for thousands of years in process of formation from the intermingling of decaying vegetable matter with the fertile leachings brought down by the streams from more elevated areas of the State. Not only so, but in the prehistoric lagoonal areas, that now underlie these peaty lands, swarmed millions of fishes and various crustacea that left their remains in the form of marl beds which now furnish lime for various purposes throughout this section. Thousands of acres of this black land are already under cultivation and large drainage enterprises are yearly opening up thousands of additional acres for the growing of corn. Here we have the highest average yield in this State. Indeed, this section is famous for its corn crop.

Organic matter and well-drained land are prime requisites to successful corn growing in North Carolina. As we proceed westward from the eastern section, we find the soils growing more sandy and lighter in color, due to the evident lack of humus. But one will be surprised to see the large crops of corn that can be grown on this relatively poor soil by a liberal use of crimson clover, cowpeas, rye, vetch, etc., plowed under as a green manure, supplemented by a limited amount of commercial fertilizer. The former furnishes the necessary organic matter at a nominal cost, which in itself supplies nitrogen and renders available quantities of otherwise inert mineral plant foods inherent in the soil. The latter adds plant food and corrects certain deleterious soil conditions. Finally, we come to the mixture of red and gray soils of the piedmont section. Here in Wake County, near the city of Raleigh, was produced in the year 1909 the world's greatest yield of corn up to that time. The accompanying cut shows the farmer on the acre that made 226 $\frac{2}{3}$ bushels of corn. The unprecedented yield was made, of course, under intensive methods of cultivation, but when we note that only eight bushels of wheat grew on this acre the year before, it shows us what can be done on the poorer lands of the State by sane methods of agricultural practice. In this connection it will be interesting to note that there were made by mere boys last year—boys between ten and eighteen years of age—yields ranging from 39 to over 146 bushels to the acre, with a general average of over 58 bushels to the acre. These yields were made by 364 boys in about sixty different counties. This shows that good yields can be made in North Carolina by simply putting into practice methods already known to the man of average ability and emphasizes the great possibilities that will surely be realized in this State should the most approved practices be followed by say 50 per cent of the farmers.

The red lands in the piedmont section grow excellent corn when produced in connection with clover, peas, or some other green manuring crop plowed under in the fall before or even with rye plowed under in



226 2-3 BUSHELS CORN ON ONE ACRE, GROWN BY J. F. BATTS, GARNER, N. C.

the spring some days before planting—provided the rye is cut with a disc harrow a few times before turning in and the corn planted rather deep below the surface (but covered shallow), to prevent the cutting off of the water supply from the subsoil during the growing season.

In the mountainous section corn does especially well on the bottom-lands along the French Broad, Swannanoa, and other streams, in case the early maturing varieties are selected.

Generally speaking, each section of the State has its "best varieties" of corn. A large one-eared corn seems to be the favorite on the black, peaty soils in the east. In the coastal plain a prolific corn seems to give the best results. This is also true of the piedmont section, but there are a number of good local varieties that make good yields of high quality. The Department advises, further, that each farmer breed up his own corn on his own farm and adapt it to his own soil and climatic conditions.

OATS.

Good winter oats are grown in all of North Carolina except the mountains. Here the oat crop is sown in the spring. In the cotton section oats furnishes one of the leading horse feeds, but we do not grow nearly enough to supply the demand and hundreds of thousands of bushels are shipped into the State every year for the teams used on the farms.

Oats will grow and make good yields on soils that will not grow wheat commercially. The sandy lands that are well supplied with organic matter make very good yields of oats. Due to its wide range of adaptability, oats may be grown in all parts of the State. As a horse feed its high value is everywhere recognized.

POTATOES.

The potato lands of North Carolina are unsurpassed anywhere in the United States. The deep, black, sandy loams of the extreme east, the lighter sandy loam of the upper coastal plain, when supplied with humus; the gray sandy loam of the piedmont, when properly supplied with humus; and the dark, sandy and silty loam of the mountains, especially along the French Broad, Swannanoa, New and other rivers, produce heavy yields of potatoes of the finest quality.

Both sweet and Irish (or white) potatoes do well in all but the mountain section. Here the Irish potato finds conditions best suited to its growth—a northern climate in a southern latitude. Sweet potatoes do best in the sandy loams in the piedmont and eastern section of the State. Hundreds of thousands of bushels of both sweet and Irish potatoes are grown in the State every year and shipped to northern markets or consumed by our local trade. The potato crop is really one of the big crops in the State and is yearly increasing in importance.

FORAGE CROPS.

In the mountains the farmers want to depend on red clover, sapling clover, crimson clover, soy beans, Canada peas, timothy, orchard grass, blue-grass, rye, and native grasses for their pasture and forage crops.

In the piedmont section the farmer wants to make large use of red clover, crimson clover, cowpeas, soy beans, Canada peas, and oats, rye, tall meadow oat grass, herds' grass, orchard grass, and the native grasses. To this may be added the Japan clover, a plant found wild on nearly every farm in this section.

In the coastal plain the most useful forage and soil-improvement plants are the crimson clover, burr clover, hairy vetch, cowpeas, soy beans, and rye. These grow especially well in the sandy soils of the Atlantic seaboard, and some or all of them should be on every farm, whether that farm is given over wholly to stock raising or is engaged in a mixed husbandry.

On the rich lands of the extreme east all of the above plants do well, but the burr clover and crimson clover may be replaced to some extent by red clover, as they are primarily soil-improvement crops, and these rich lands are all full of organic matter and need, as a general rule, only phosphate and potash, with an occasional application of lime, to correct possible acidity and to break down the existing large amounts of organic matter in the soil, thus rendering available organic nitrogen.

INTENSIVE AND EXTENSIVE FARMING.

We advocate only intensive farming in North Carolina. But we advocate it on a large scale. When we can, by sane and simple methods that every man can put into practice, produce a bale or bale and a half of cotton to the acre on a 50- or 100-acre farm, we farm intensively on a large scale. When we grow 60 or more bushels of corn to the acre on a 100-acre tract, we farm intensively on a large scale; but when we produce one-fifth of a bale of cotton to the acre on a 10-acre tract, we farm extensively on a small scale. When we grow 15 bushels of corn to the acre on 10 acres of land, we are farming extensively on a small scale, and it is easy to see that the more of this kind of farming we do the poorer will we be at the end of the year. As above noted, it has been demonstrated beyond the possibility of a doubt that we can, by proper methods of cultivation, and the liberal use of green manure and stable manure and a judicious application of commercial fertilizers, make good yields of all crops suited to this latitude, and the reason why many are not making the most profitable yields lies either in their lack of the proper information or their unwillingness to put proper methods into practice.

FINALLY.

The prices alone on farm products in North Carolina should engage the serious attention of any farmer anywhere in the United States who is seriously contemplating a change of location. Last year when corn

was worth 38 cents a bushel in Illinois, it was worth 76 cents a bushel in North Carolina; when Indiana markets were paying 40 cents a bushel for corn, North Carolina markets were paying 76 cents a bushel; when the Ohio farmers were selling their corn for 36 cents a bushel, the North Carolina farmers were selling theirs for 76 cents. When Illinois wheat was worth 88 cents a bushel, North Carolina wheat was worth \$1.10; when Indiana wheat was worth 87 cents, North Carolina wheat was worth \$1.10; when Ohio wheat was worth 90 cents, North Carolina wheat was worth 20 cents more on the bushel. When Illinois oats were worth 30 cents a bushel, North Carolina oats were worth 60 cents; when Indiana oats were worth 31 cents, North Carolina oats were worth 60 cents; when Iowa oats were worth 27 cents, North Carolina oats were worth 60 cents; when Nebraska oats were worth 28 cents, North Carolina oats were worth 60 cents; when Michigan potatoes were worth 31 cents a bushel, North Carolina potatoes were worth 73 cents a bushel; when Wisconsin potatoes were worth 35 cents a bushel, North Carolina potatoes were worth 73 cents a bushel. When Kansas hay was worth \$7.80 a ton, North Carolina hay was worth \$14.60 a ton; when Oklahoma hay was worth \$8.40 a ton, North Carolina hay was worth \$14.60; when Minnesota hay was worth \$9.10, North Carolina hay was worth \$14.60; when Iowa hay was worth \$9.60, North Carolina hay was worth \$14.60.

FRUIT GROWING.

THERE is probably no branch of agriculture that has developed in the past twenty years so strikingly as has the fruit industry. It has grown in a quarter of a century from a more or less general and relatively unimportant line of agriculture to a highly specialized line of great importance. Owing to the great range of climatic and soil conditions in the State of North Carolina, unlimited opportunities are here presented for the successful and profitable cultivation of most of the fruits of the Temperate Zone.

That fruits of superior quality can be grown in North Carolina was shown at the National Horticultural Congress, Council Bluffs, Iowa, in 1910, when the Sweepstakes Trophy for the best general collection of fruit in the United States was won by North Carolina against the keenest competition. At this great exhibition there were fruits from Canada to Mexico and from the Atlantic Ocean to the Pacific, thirty-three States in all competing. Besides this magnificent trophy, several other first premiums were awarded individual exhibits of fruit from this State. All this goes to show that there are unlimited possibilities for the development of the fruit industry in this State.

APPLES.

The leading orchard fruit in North Carolina is the apple. While this fruit can be grown, at least for home use, in every section of the State, the production of apples for commercial purposes is largely confined to



APPLE TREE IN WILKES COUNTY, N. C. THIS IS THE LARGEST APPLE TREE IN THE UNITED STATES. THE TREE IS APPARENTLY SOUND AND MEASURES 16 FT. 5 IN. CIRCUMFERENCE AT THE GROUND, 12 FT. 6 IN. JUST BELOW FIRST LIMBS. THIS TREE WILL BEAR A GOOD CROP OF APPLES THIS YEAR.

the elevated sections just east of the Blue Ridge and in the mountain country beyond. This wonderful region of valley, plateau, and mountain-side is one of the finest apple regions in the United States, and is as yet largely undeveloped. Here a rich soil, combined with high elevation, affords ideal conditions for commercial apple culture. It is in this section, where altitude guarantees a cool climate, that the apple grows and thrives and produces even better than it does in the renowned apple region of the North. Here, too, the clear air and abundant sunlight put the rich colors on the outside of the fruit and the fine flavors within. It is not generally known to apple growers that a mountain region in the South, by virtue of its altitude, affords the same cool temperature that a northern region gives and has the advantage of more sunlight and a longer growing season.

While the apple industry in this State has by no means reached its highest point of development, there are at present more than 2,000 orchards containing approximately 1,000,000 trees. These orchards range in size from 500 to 30,000 trees, many of them yielding their owners a very profitable income. The South affords ample markets at good prices for all the apples grown. All that is necessary to make the apple business a paying one in western Carolina is to give the orchards the cultivation and care necessary to produce clean fruit.

PEACHES.

Peaches are grown pretty generally over the entire State. From a commercial standpoint, this industry has become most highly developed in what is known as the sand-hill country in Moore and Montgomery counties. In this section there has never been a total failure of the crop, and the fruit produced on these sandy soils is of high color and excellent quality. At Southern Pines, in Moore County, there is a single orchard containing 60,000 trees. At Candor, in Montgomery County, is an orchard of 30,000 trees. Besides these, there are numerous smaller orchards containing thousands of trees. In the mountains many commercial apple growers are planting peach trees as fillers in their apple orchards. Here the trees grow well and bear heavy crops of fine, highly colored fruit that finds a ready sale both on the home market and when shipped to distant markets.

PEARS.

Pears are grown in all parts of the State, but on account of the ravages of pear blight there are very few commercial orchards of any size. Owing to the deadly work of this fatal disease, most of the high-quality varieties are disappearing from cultivation. The varieties grown most largely in a commercial way are those of the Chinese class. Kieffer pear trees grow here to large size and ripen their fruit more perfectly than they do further north. For canning purposes, Kieffer pears are very profitable. Pears seem to be most resistant to blight when grown

slowly in the clay soils of the piedmont section, although they have been grown successfully in the sandy soils near the coast and also at the higher altitudes in the mountains.

PLUMS.

Native and Japanese plums thrive well in all parts of the State. Japanese varieties are especially valuable for the coast region, where they grow in the greatest profusion and with the most ordinary care. Unfortunately, the European plums do not do well except in the cooler mountain regions, where they grow abundantly. Plums would be more extensively grown were it not for the fact that peaches grow so well everywhere and produce fruit for which there is always a greater demand.

QUINCES.

Quinces are of less commercial importance than the other fruits, but in all parts of the State a home supply can be easily grown. On account of its natural habits, the quince requires a deep, moist, fertile soil. Locations of this kind can be readily found from along the coastal plain to the elevated coves in the mountain sections.

CHERRIES.

Cherries will thrive in a great variety of soils; the sweet varieties, however, cannot be grown to any extent in the warmer parts of the State. The trees grow and are perfectly healthy, but they fail to produce crops. Morelloes and other sour varieties, characterized by a slow, firm growth, thrive in all sections. The English or sweet cherries are large, rapid-growing varieties that grow to perfection in the rich soils and cool climate of the mountains. They do fairly well in the piedmont region, but are almost invariably unsuccessful in the coastal plain.

GRAPES.

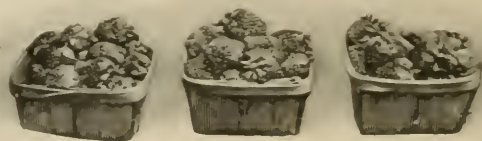
Almost all of the cultivated varieties of grapes produce well in every section of the State if they are sprayed to protect them from fungous diseases. A considerable industry in commercial grape growing has been developed at Southern Pines, in Moore County, and at Tryon, in Polk County. The soil and climatic conditions in North Carolina seem to be admirably adapted to grape culture. Delawares and Niagaras grown here are unsurpassed in beauty and quality by the same varieties grown elsewhere. In the neighborhood of Southern Pines over 1,000 acres are cultivated in the production of this fruit. No wine of any amount is made, since it is more profitable to market the fruit in the fresh state.

The *Rotundifolia* type of grapes, of which the Scuppernong and James are the most important varieties, is native to the sandy soils of the coastal plain region. These grapes are practically free from the attacks of insects and fungi and produce enormous quantities of de-

licious fruit with only the most indifferent tillage. Owing to the fact that they do not stand shipment well, these grapes are almost unknown to northern people. However, experiments are now under way to develop market varieties of this valuable native fruit.

STRAWBERRIES.

So far as the growth and perfection of the fruit is concerned, there is no section of the State where the finest strawberries cannot be grown. The main point to be considered in the cultivation of this fruit for market is the fact that the strawberry is grown commercially in all parts of the country, and that each section from Florida to Maine has its own season in the market. Hence, to make strawberries profitable for shipment north, they must be grown where the climatic conditions warrant an early ripening of the fruit, so that it can be placed on the market before localities further north come in with their berries. For this reason the culture of the strawberry as a commercial crop has been confined to the lands of the coastal plains, where soil and climatic conditions combine to make this business very profitable. The first really fine berries sent north are from Columbus County in this State. Earlier in the season strawberries come from more southern sections, but



MORE THAN 100 REFRIGERATOR CARS OF STRAWBERRIES SHIPPED
FROM CHADBOURN, N. C., IN A SINGLE DAY.

none of them are equal in quality to those produced in the counties of Columbus, Duplin, and Wayne. Around the towns of Mount Olive, in Wayne County, and Faison, in Duplin County, the strawberry industry had its beginning. From a small start a few years ago, the business of strawberry growing has increased to vast proportions and hundreds of car-loads are annually shipped north. Chadbourn, in Columbus County, has the reputation of being the largest strawberry shipping point in the world. In the height of the season whole trains of iced cars of berries are shipped daily from this station.

Great improvements have of late been made in the marketing of the berry crop. The fruit is now sold at the stations for cash, to the buyers, who distribute the cars to the various northern markets. This system has been found to be much more satisfactory than when individual growers shipped to commission merchants in the cities and took all the risks.

While the coastal section will always be the region for profitable strawberry growing for northern markets, yet the increasing number and

size of the towns and cities in the State will create home markets for a great deal of fruit. This will result in the development of the strawberry industry in other localities, making their culture for home use profitable. Home markets are apt to be overlooked and poorly supplied. The demand for berries of high quality is always good and is ever increasing with the annual increase in population. Even with an excess of fruit, there would be room for the development of canning industries to compete with similar establishments in other States.

DEWBERRIES.

The dewberry crop is one that is annually assuming increasing proportions. While this fruit is grown to some extent in the coastal plain, the sections where the development of the industry has been greatest are along the lower piedmont, at Ridgeway in Warren County, and at Cameron, Southern Pines, and Aberdeen in Moore County. Soil and climatic conditions produce here large, fine-flavored fruit that can be placed in the northern markets at a time when it will command a profitable price.

BLACKBERRIES.

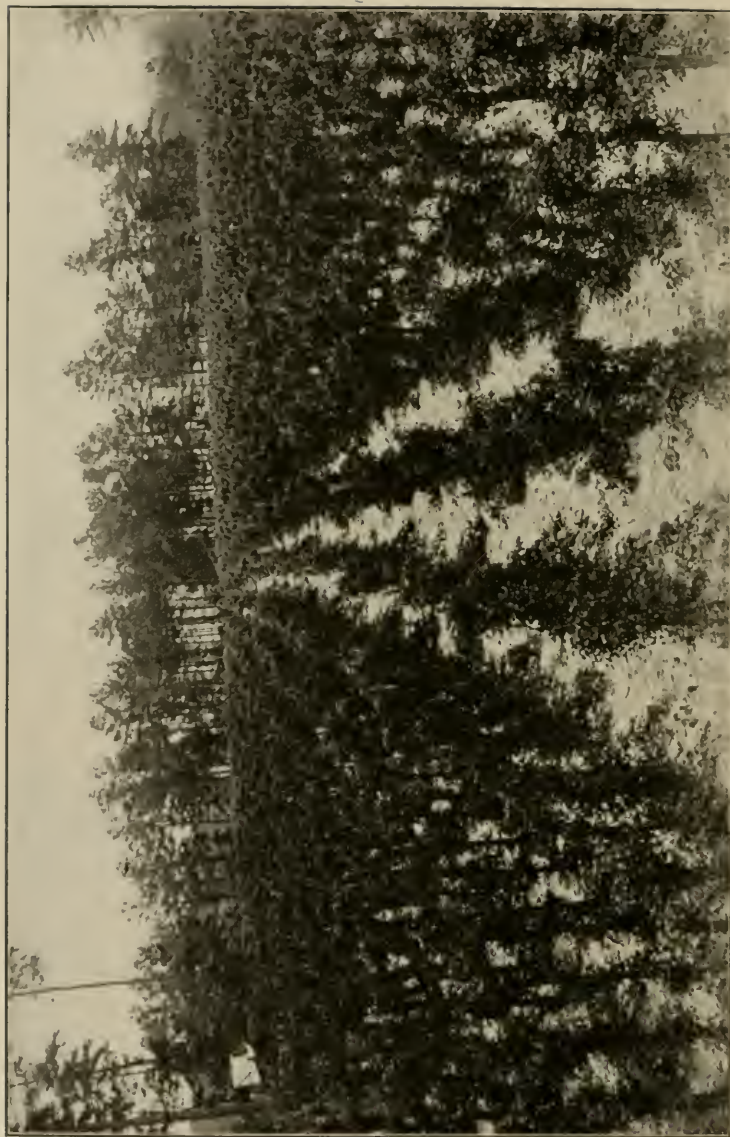
The later and upright-growing blackberries are also grown to a considerable extent and over a wider territory than the dewberry. In fact, there are numerous varieties of wild blackberries in all parts of the State from which as fine sorts as those in cultivation could be selected. This is particularly true of the mountain and upper piedmont sections, where blackberries of the finest quality grow so profusely that little attention has been given to their cultivation. In many localities these wild berries are canned and marketed to profitable advantage.

RASPBERRIES.

Raspberries, like strawberries, can be grown in practically all parts of the State, but they do not thrive so well along the coastal plain as in the piedmont and mountain sections. In the eastern section the raspberry will never be of commercial importance, since the climate is too warm for the largest crops and the fruit does not bear like the strawberry and dewberry. Here the plants need to be grown in rich, moist, clay soils. They should be carefully cultivated, and shaded to carry them through the long summer. In the moist clay soils of the piedmont the raspberry thrives finely and can be made a profitable crop for local markets. In no part of the country, however, does this fruit grow better than in the rich soils of the valleys and plateaus of the mountain country, where the cool climate gives the same conditions existing further north.

CRANBERRIES.

The cranberry grows wild in two sections of the State, but up to the present no attempt has been made to develop a commercial cranberry industry. The conditions necessary for success in cranberry culture



DEWBERRIES, CENTRAL NORTH CAROLINA. A VERY PROFITABLE CROP.

are soils of a peaty or alluvial nature provided with an ample and easily available water supply and an easily accessible supply of sand. These conditions are found in the territory between Albemarle and Pamlico sounds, and in several localities of higher altitudes along the Alleghany Mountains in the northwestern part of the State. The successful development of a cranberry industry has been in localities where the fruit occurs as a native plant. The commercial cranberry bog or meadow should combine as many as possible of the elements which characterize the natural habitat of the cranberry.

WHORTLEBERRIES OR BLUEBERRIES.

No attempts that we know of have been made to cultivate these berries, but the wild crop is of great importance in the southeastern part of the State. In some counties the fruit has a great reputation and forms an important crop from the swamp lands. The annual shipments amount to perhaps \$100,000.



THE EASTERN SECTION OF NORTH CAROLINA IS ADAPTED
TO GROWING PECANS.

TRUCK GROWING.

NO STATE in the Union offers a broader or more complete field from a horticultural standpoint than North Carolina. The various climatic conditions, ranging from that of subtropical in the east to almost Canadian conditions in the mountainous sections of the west, give to North Carolina an interesting and favorable place in the trucking industry of this country. The high, cool mountain regions are well adapted to growing late vegetables for home and southern markets; while the coastal plain, with its level, mellow, sandy loam, easy of cultivation, retentive of moisture, and abounding in decomposed vegetable matter, is admirably adapted to the production of early vegetables for northern markets. With these unsurpassed natural conditions and the use of frames covered with cloth or glass, and, in some cases, the installation of modern steam-heating and irrigating systems, the trucking industry has made wonderful strides in late years, and the production of vegetable crops in winter and early spring is carried on with great success. With the present facilities for rapid transportation, the vegetables grown in eastern North Carolina are but a comparatively short time from the best markets in America. All indications are that the business of supplying early vegetables, especially of the finer sorts to the rapidly growing northern cities, is certain to increase in size and profit beyond its present large proportions.

IRISH POTATOES.

Among the truck crops of eastern North Carolina, the Irish potato has taken quite a prominent place, particularly so for early market, and, to a less extent, a second crop for late market and for "seed." Potatoes are also grown to a certain extent in the mountain regions for late market. In all, the Irish potato crops bring to the truckers of North Carolina an annual income of between a million and a half and two million dollars. Like other truck crops, the potato has had its fluctuations in price; but this has become less marked since each section maintains its place in the procession of the early potato season, from Florida to Maryland. Thousands of barrels of potatoes are planted every year for the early crop. They are planted in February and go to market in June, thereby giving time to grow a crop of cowpeas on the land until it is needed to plant the second crop of potatoes in August; or corn may be planted and cowpeas planted at the "laying by" of the corn. In either case, three crops are grown, one being a leguminous crop, which is very important in vegetable culture. In some sections cotton is planted between the rows of early potatoes at the last working, and when the potatoes are dug and shipped, the cotton is given the entire land; but for

the welfare of the truck crop, this practice is not to be encouraged. It is always better to arrange the crops in such a way as to get in a crop of cowpeas. On heavily manured soils the native crab-grass grows rapidly in warm weather, and this mixed with cowpeas makes an excellent hay. The second crop of Irish potatoes is planted in August from "seed" of the first crop, and is allowed to grow until frost. They are then lifted, placed in piles and covered with earth, which keeps them looking perfectly fresh and good. During the winter they may be barreled and shipped to the northern markets, where they will often bring from \$4 to \$7 per barrel.

SWEET POTATOES.

Sweet potatoes are grown more or less in all parts of the State, as a quantity sufficient for home use can be grown under a wide range of conditions. For market purposes they are grown principally in the lower piedmont and coastal sections. The varieties used for trucking are different from those planted for home use and local markets; for northern markets demand a dry, starchy potato, while the potatoes planted for home consumption are largely the so-called yam, or moist, sugary varieties. A Northerner coming South usually brings with him his preference for the dry potato, but after a time realizes the superior quality of the yam varieties. Eastern markets are usually well supplied, but there are sections where the sweet potato is not fully appreciated as a food. Hence the field for the production and use of sweet potatoes is very broad and the crop promises to become one of very great importance.

The culture of sweet potatoes is not so intensive as the culture of most truck crops, as they thrive best on only moderately fertile soil; will even yield a good crop on poor soil. On very rich soil they grow too much to vines. The lighter gray soils of the piedmont section and the sandy lands of the coastal plain will yield at little expense abundant crops of sweet potatoes. With careful cultivation, a yield of as much as 500 bushels per acre can be attained. Other conditions being equal, the heavier yields are from the plants which are set early from the bedded potatoes; but potatoes grown from tips of vines cut and set in July will keep better through the winter than the earlier crop. Sweet potatoes are inexpensively cultivated and rather cheaply harvested by means of implements for the purpose, or, on small areas, by means of an ordinary turning plow. As soon as dug they should be graded to uniform shape and size. For market they are packed into ventilated barrels with burlap covers. When care is exercised in cultivation, harvesting, and marketing, potatoes are usually profitable. Sweet potatoes are also a valuable crop for the growing and fattening of hogs.

CABBAGE.

The cabbage grown for northern markets is the early cabbage produced in the trucking regions of the coastal plain. There it occupies quite a foremost place among early truck crops. The seeds of early

varieties, such as Jersey Wakefield, Charleston Wakefield, etc., are sown in beds at intervals from the first of September to October. The plants are transplanted to the field during the latter part of November and the first of December. To be on the safe side, truckers usually make several sowings; for the plants should be just right for planting when they are put out, or they may, as a result, run to seed before heading. Of course, by this method more plants will be grown than will really be needed; but this fact does not necessarily mean a serious useless expense, since the seed is cheap and has excellent vitality. Cabbage is packed in crates holding about a barrel, and shipped north in March and April. The northern markets have learned to depend upon the North Carolina cabbage; and when it is placed upon the market in good condition it rarely fails to sell to advantage. Cabbage yields heavily and as a whole is one of the most profitable truck crops of eastern North Carolina. What the early cabbage is to the coastal section the late summer and fall cabbage is to the mountain region of the west, where it is grown to supply home and southern markets. In the mountain section late cabbage is an important crop, as climatic conditions there are very favorable to late cabbage culture. A ready market is found in southern cities where the climatic conditions are not favorable to the growth of late cabbage. Notwithstanding its present proportions, this industry has not nearly reached the limits of its possibilities.



LETTUCE GROWN UNDER COVER, EASTERN NORTH CAROLINA.

LETTUCE.

For the area planted and the time the land is occupied, lettuce is probably the most profitable crop of the coastal plain. Owing to the mild climate, the warm, responsive soil, and bright winter sunshine, lettuce is successfully grown during the fall, winter, and spring months. According to the location, climatic conditions, and season of year, lettuce growing in North Carolina is carried on under three different methods:

(1) Steam-heated and irrigated frames; (2) Covered frames without artificial heat and irrigation; (3) Open-field culture. The open-field culture is practiced in the warm southeastern part of the State. By the frame method earlier lettuce can be grown, and this usually finds a better market than the later crop. It goes to market in competition with that grown in Florida and in the greenhouses of northern cities. Market records show that North Carolina frame-grown lettuce commands a high place in the best markets. The spring lettuce, which is the most important of the lettuce crops, comes at a time when the Northerner is hungering for something green; and, if good lettuce is put on the market in first-class condition, the grower can rest assured that it is going to sell to advantage. Lettuce being a rapid-growing plant, maturing in from seventy to ninety days from the time of planting, and growing more profitable under intensive culture, lends itself well to a rotation with other quick-growing, high-profit crops, such as cucumbers, eggplants, cantaloupes, beets, radish, beans, etc. By proper rotation three or four crops can be grown on the same ground in the course of a year. As the methods for successful lettuce culture are very intensive, they are necessarily costly; but the profits are correspondingly large. A good crop of lettuce usually brings \$1,000 to \$1,500 per acre.

ONIONS.

Good onions can be grown on a great variety of soils if well enriched and in good physical condition; but sandy loams and reclaimed swamp lands are preëminently the onion lands of the country. In eastern North Carolina are found thousands of acres like the lands of the great onion sections of the North and West. But in the coastal plains the onions in which the truckers are mostly interested are the green onions for bunching and shipping in early spring. Therefore the sandy lands are used, as they are warmer and "quicker" than the peaty lands. However, the ripe onions grown on these swamp lands are models of perfection. The green onions are grown from "sets," which are small onions forced to ripen prematurely by having been sown very thickly. The "sets" are planted in September and the green onions are ready to bunch and ship from February to April. There is always a demand for early onions in all markets, and usually they bring good prices. For ripe onions the seeds are either sown in beds and the seedlings transplanted to the field, or are sown directly where the onions are to grow. The large Prizetaker onions can be grown to perfection in the rich, mellow bottom-lands of the mountain sections. They come in during the early summer before any northern-grown onions are ripe, hence these early ripe onions invariably sell to advantage. Notwithstanding the fact that millions of bushels of onions are produced in America every year, the supply is not sufficient for the demand; for more than a million bushels are annually imported from Spain, Egypt, and elsewhere. In view of these facts, the excellent field for the production of first-class onions is readily seen.

WATERMELONS.

For home consumption and local markets, watermelons are grown in all parts of the State. For shipping to northern markets they are produced in the warm, light soils of the coastal section and on the sandy lands of the lower piedmont region. On the sandy soils of the long-leaf pine section melons are grown unsurpassed in size and quality. The varieties grown there for market are the smooth, firm melons, that ship well. The round kinds are preferred to the long ones, as the former pack better in cars. The counties of Scotland and Robeson alone ship annually to northern markets something like 1,500 iced cars of melons. At the height of the shipping season whole train-loads of melons leave from different stations along the Seaboard and Coast Line railroads.



SOME TRUCKERS IN NORTH CAROLINA PLANT FROM 75 TO 100 ACRES IN CANTALOUPE ON A SINGLE FARM AND ARE INCREASING THEIR ACREAGE EACH YEAR.

CANTALOUPE.

Like cucumbers, the early cantaloupes are profitable. They are planted and treated very much as cucumbers are. Although they are more often grown in the open, they are sometimes grown in frames after lettuce. Coming as they do, they fit in well in rotation with lettuce in frame or field culture. Lettuce comes off in March and April and cantaloupes occupy the ground until July, when they in turn vacate the land in time for a crop of cowpeas, or a second crop of Irish potatoes. For shipping to northern markets only the small early varieties, such as the Netted Gem or Rockyford, are grown, as these are more in demand and will pack and ship better than the larger varieties. Cantaloupes have been found from experience to be a very profitable crop. In the neighborhood of 1,200 cars are grown in North Carolina and shipped every season to northern markets.

CUCUMBERS.

The cucumber, giving best results on warm, quick soils filled with sufficient vegetable matter to hold a good supply of moisture, naturally finds an important place among the truck crops of the coastal plains of North Carolina. When they are grown early, they are profitable; in fact, earliness determines to a great extent the degree of success of the crop. It will usually warrant the market gardener going to some extra trouble and expense to attain this end. The plants are started in frames and hotbeds; but, as they transplant with difficulty, it is better to start them in pots and transplant to the field when all danger of frost is over. They are grown to a large extent in frames after lettuce, in which case they come off in July in time for a crop of cowpeas or a second crop of Irish potatoes. They can be shipped north till the price falls, then the remainder can be sold to the picklers. Early cucumbers will bring as much as \$2 per bushel basket, and a thousand baskets per acre is not an uncommon yield. They, like tomatoes, can be successfully "forced" in the greenhouse.



PEAS ARE PERFECTION IN NORTH CAROLINA.

ENGLISH PEAS.

The early crop of English peas is a very important one to the market gardener in eastern North Carolina. The main crop of the extra earlies is usually sown in January and goes to market late in April and early May. Single growers will often plant a hundred acres in peas. They are a cheaply grown crop and are soon off the land, and the vines turned under are valuable for the improvement of the soil and can at once be followed by some later crop, such as cucumbers or melons.

TOMATOES.

Tomatoes are grown in the home garden in all parts of the State, but for shipment to northern markets the growing is confined to the early tomatoes of the coastal section. When sufficient trouble is taken to get them early, they are profitable; but later the crop is seriously damaged by sun-scald, the plants are liable to blight, and they are forced to give place to tomatoes grown in localities farther north with shorter hauls and cheaper freight. To get them as early as possible, they are started in pots and afterwards transplanted to the field. The greenhouse culture of tomatoes offers good possibilities to the market gardeners of North Carolina; for here the climate is so mild that not much additional heat is necessary, and they may be grown more cheaply than in the colder North. A ready market and fancy prices can always be had for greenhouse tomatoes. Tomatoes grow luxuriantly in the cool mountain section of the western part of the State. This section offers an excellent field for tomato culture for canning purposes.

STRING BEANS OR SNAPS.

These are very largely grown by the market gardeners, and, when early, they pay well, as they are cheaply grown, need light fertilization, and are out of the way in early summer, so that a hay crop of peas and crab-grass can be grown on the same land, the dead bean tops helping to fertilize the land. Muskmelons are sometimes planted between the rows in alternate rows and the bean vines turned under for their benefit after the beans are shipped, and these followed by a volunteer crop of crab-grass hay or by the second crop of Irish potatoes; for no market gardener is satisfied with less than two crops annually on his land, and often gets three or four, for the second-crop Irish potatoes can be at once followed by the early cabbage crop from plants set in December.

CAULIFLOWERS.

These, like the early cabbages, are set in the fall, but are not so largely grown. Sometimes they are set in the frames and the remaining space filled in with lettuce and the cauliflower given the full room as the lettuce is cut out. Grown in this way, they come into head in March and can be made quite a profitable crop.

LIMA BEANS.

The large lima beans which we often find on the market and which bring such good prices cannot be profitably grown in North Carolina except in the cool mountain soils of the western part of the State. On account of the general humidity of the climate, the large beans are too unproductive in the warmer part of North Carolina to warrant their cultivation, though the small lima, or butter bean as it is more often

called, can be quite successfully grown in any part of the State, provided the land is well enriched. It is useless to try to grow lima beans on poor soil. The value of these small lima beans is not fully appreciated. They are extremely productive, and if well handled keep up a supply of beans until the first killing frost. The cultivation of the large lima beans in the mountain region and the small limas in the east could make for North Carolina a significant and profitable industry.

BEETS.

As is necessary for all root crops, beets want deep, mellow, easily penetrable soil, and for earliness they need a "quick," warm soil—two conditions conspicuously present in the trucking region of eastern North Carolina. Very early beets are generally grown in well enriched lettuce frames following cuttings of November and December lettuce. They are also grown to quite a considerable extent from seeds sown in the open about February, producing beets ready for bunching in May. Since earliness is an important factor, those sown in frames give much better results; for beets in frames will be ready for bunching and shipping by the time those in the open field are showing above ground. The open-field culture is less expensive, but risky, while the frame culture is more expensive, but at the same time more assured. In either case, when beets are produced comparatively early they are profitable.



CELERY A POPULAR TRUCK CROP. ESPECIALLY IN
WESTERN NORTH CAROLINA.

CELERY.

Celery is naturally a cool climate plant, thriving best in very rich, moist soil. It therefore grows to perfection in the rich cove lands of the mountain counties of North Carolina. Celery can be grown successfully in the reclaimed swamp lands in eastern Carolina by setting the plants between corn rows so that the plants will get shade in the hot

months. Practically all the celery grown for commercial purposes, both in Michigan and Florida, is grown on reclaimed swamp lands, the like of which thousands of acres can be obtained in eastern North Carolina. These peaty lands will produce celery of equal quality to the Michigan and Florida celery and at very much less expense. In the moist bottom-land of the piedmont section celery grows excellently, and in the cool valleys of the mountain country it attains a quality that cannot be excelled anywhere. Since many of the home markets are poorly supplied with celery of first-class quality, a very profitable industry could be carried on in the mountain section of this State, supplying the home and southern markets with fine celery. As celery is no longer looked upon as a luxury eaten only by those who can afford to pay a fancy price for it, but as an excellent, wholesome vegetable of general fare, a ready market can always be found for good celery.

ASPARAGUS.

Asparagus is quite an important crop to the market gardeners of the coastal section, where the warm, mellow sandy soil produces early crops of excellent quality. As North Carolina asparagus is a well-known article in the northern markets, it rarely fails to bring a good price when proper care has been exercised in its production, harvesting, and marketing. As this is an old and popular vegetable, the demand is always good. Due to its earliness, of course, the eastern part of the State is preëminently the asparagus-growing section for northern markets. As local markets are often meagerly supplied with this wholesome vegetable, a profitable industry could be made in many parts of the State in producing asparagus for the home market.

EGGPLANT.

Eggplant is a handsome and wholesome vegetable annually becoming more common in markets. It requires a long growing season, a warm, loose and fairly dry soil, and a guaranty that they will not be forced to stop growing from the time the seed germinate to the time the fruit is set. The demands relative to the soil and season are found typified in eastern North Carolina, while of course the latter demand depends largely upon the individual grower. If sufficient pains are taken they can be grown admirably in the warm sandy loams of North Carolina. To get them early, they are started in pots and transplanted to the field when all danger of frost is past. They can be worked well in frames from which lettuce has been cut. Although they are rather a bulky article to ship, if they are gathered at the proper time and well packed, this is not a great disadvantage. When eggplants are put on the market relatively early and in good condition, they always sell to advantage.

KALE AND SPINACH.

Kale and spinach are sown by market gardeners in the fall for shipment during winter and early spring. During severe winters when these crops are killed in the north, the southern-grown crops sell to advantage. Spinach, being the more delicate of the two, usually sells for the higher price. They are both hardy, yield heavily, are cheaply grown, and occupy the ground only during the cool season. They come off in sufficient time for the spring truck crops. Therefore, when they sell well, they are exceedingly profitable. Even in those seasons when they do not command a high price, it pays to grow them as a cover crop to turn under in the spring. Kale and spinach are grown in eastern North Carolina as cheaply and to as great perfection as the crop in the great trucking region around Norfolk, Va., where hundreds of acres are planted to these crops every year.

LIVE STOCK.

LIVE STOCK can be grown to as good advantage in this State as in any other State in the Union. The western portion or mountain section of the State is especially adapted to the growing and handling of beef cattle. The natural blue-grass range, with the large number of streams of clear, pure water, and the abundance of shade, provide the best of pastures. In this section of the State are located numbers of herds of pure-bred animals of all beef breeds—Short-horns, perhaps, taking the lead. From these mountain counties many hundreds of cattle find their way to the export trade each year.

With all the advantages, both natural and artificial, this section should in a few years be one of the best beef-producing sections of the Eastern States.

The piedmont section, while not so well adapted to the growing of the blue-grass, does grow some other grasses which are admirably suited to the handling of cattle. Winter pasturage crops are grown and cattle grazed all the year.



All through this section dairying has been developed to a considerable extent. There are a number of herds of grade Jerseys and Holsteins which are producing nicely. Many pure-bred herds of both breeds are located in almost every county. Many individual Jersey cows can be found which have a butter record of 400 pounds or more per year.

Creameries have been established in different localities and have proven of great benefit to the farmers.

The eastern or coastal plain section of our State abounds in natural grasses. Many cattle make their entire living for the whole year on these ranges. Along the banks of the streams the reed pastures stay green throughout the year. With care and attention this industry can be developed to a wonderful degree. The class of cattle has been materially improved. There are numbers of herds of pure-bred beef and dairy cattle throughout this section which have given very satisfactory results. There is a breed of horses known as Banker ponies which run

wild in the extreme eastern section along the coast and mature into very good animals well suited to light driving. Once each year these ponies are driven into pens and branded. Numerous flocks of sheep, cattle, and hogs are also raised in this section without any feeding or other attention.

The Department has taken up the manufacture of Anti-Hog Cholera serum. We inoculate hogs throughout the State and find that now the disease is practically under our control. With the natural resources and this disease under control, this industry certainly will develop and grow to large proportions.

Two things which are always necessary to success are markets and shipping facilities. The shipping facilities are first-class. North Carolina is a consuming rather than a producing State for bacon and the by-products. With all these advantages, the future for bacon production in this State is practically assured.

Sheep raising can be carried on with success, the western counties being specially adapted to this industry.

Poultry can be made profitable in all sections of the State.

Horses, cattle, hogs, and sheep have been much improved recently, as the North Carolina Department of Agriculture has been placing suitable pure-bred sires in various sections of the State. These sires are owned by this Department and placed in the hands of good farmers for the benefit of the community.

CLIMATES.

WE SAY climates rather than climate, for in North Carolina there are various climates.

In the high plateaus of the northwestern part of the State, where the forest growth is white pine, hemlock, and fir, one might imagine himself in Canada. In this section—the counties of Ashe, Alleghany, and others—the farms lie generally over 3,000 feet above the sea level, and grass and live stock are the leading interests. From these lofty elevations the State slopes to the sun and the sea, and there is a series of climates all the way to the lower coast, where we find the first tall palm-tree growth in the forest. From white pines and hemlocks to palms indicates a wonderful range of climate, and hence a wonderful range of capacities for the production of different crops, from the blue-grass of the northwestern corner to the palms and sugar-cane of the southeast section.

THE MOUNTAIN SECTION.

This is the region west of the great escarpment of the Blue Ridge, in which are found the highest mountain peaks east of the Rocky Mountains. It is a region of fertile valleys and elevated plateaus, with a climate very similar to that of the northern Middle States. The summers are cool and pleasant and the whole region is an attractive one to the summer visitor and is becoming a great summer resort. The winters are cold, but shorter than those of the Middle States north. In most mountain regions the mountain-sides are rocky and sterile, but in the mountains of North Carolina, as a rule, the mountain slopes are covered with fertile soil and in some parts of the mountain country the treeless "balds" have their slopes to their lofty tops covered with fertile soil and rich grasses, on which great herds of cattle are grazed in summer. The valleys in the southern section of the mountain country are less elevated and the climate is mild and pleasant, while the snowfall is very light. The clear streams of water that flow everywhere and the natural growth of fine grasses mark this region for cattle and the dairy, while on the uplands fruit of all kinds flourishes as it seldom does elsewhere. It is destined to be the most noted apple-growing section in the whole country. Apples from the mountain country have twice carried off the first prize at the Madison Square Garden in New York City in competition with the whole United States. Peaches attain a color and quality there which they do not reach in the lower country. They grow as handsome as the California peaches, and as to quality the California product is hardly to be named in comparison with them. In short, the mountain country is admirably adapted to dairying and fruit-growing and homes—

"Where the wing of life's best angel,
Health, is on the breeze."

THE PIEDMONT SECTION.

This section properly extends from the foot of the Blue Ridge to the line of hills some hundred or more miles eastward, which make the falls of the rivers that run from the mountains to the sea. This eastern limit is a series of elevations rising in some places to over 1,000 feet above the sea and known by various names, as the Uwharrie Mountains, Hickory Mountains, Oconeechee Hills, and Rougemont, and it extends from the South Carolina line to the Virginia line. Between this line of hills and the Blue Ridge is a rolling country of hill and dale and river and valley, with their fertile bottom-lands. In this section the two tiers of counties south of the Virginia line are mainly devoted to the production of the famous gold-leaf tobacco, which is produced in North Carolina better than elsewhere. Southward of these counties the leading crop is cotton. The whole section is evidently naturally fitted to diversified farming, with grass, grain, and cotton, with cattle to consume the abundant hay crops that can be produced. The climate of this region, sheltered from the northwest blast in winter by the high mountains west, is far milder in winter than the mountain country west of the Ridge. The snowfall in winter is light—even lighter than the sections east of it, because of the lesser humidity of the climate—and there is hardly a day in winter when farm work in the soil cannot go on. The soils of this section are largely the result of the decomposition of granitic rocks forming the deep beds of blood-red clay. Here and there this red clay is overlaid by a gray and lighter soil, the tobacco soil of the country. The red-clay lands are admirably adapted to the cultivation of wheat, and when well improved grow great crops. On the red-clay soil of this section the late Governor Holt made on an 80-acre field $46\frac{1}{2}$ bushels of wheat per acre, and the same well-improved farm makes great crops of cotton, corn, and hay. Thousands of acres of similar lands are waiting for the systematic farmer to go to work to bring out their capacities. There is no section where deep plowing and subsoiling produce greater results than on these red-clay uplands, for the piedmont red clay is all good soil down to the fast rock, when once aerated and frosted by the winter, and there are thousands of farms nominally worn out that only need a man with energy enough to break into the fertile farm that lies right under the scratch made by the little one-horse plow of by-gone days. With careless cultivation and shallow plowing these hills are apt to wash into gullies, but with deep plowing and proper level and shallow culture there is less danger of this. With one of the most delightful of climates, and blessed with health, there is no reason why the surplus lands of this section should not become the homes of many thousands more successful farmers than now, when the large farms are divided up and properly cultivated. The main line of the Southern Railway runs through this section, with branches east and west in all sections, so that railroad transportation is excellent. At almost every station one sees

cotton mills in operation, and at High Point, a town which has grown in the past fifteen years from a hamlet of 300 people to a city of over 7,000, there is the largest woodworking industry in the whole South. All these factories are taking men who were formerly on the farms, and are opening markets in all sections for garden and farm products to feed these people; for every cotton mill means quite a village to be fed by the surrounding farms. The piedmont section is a high rolling plain, rising from an elevation of about 600 feet on its eastern border next the hills to about 1,500 feet at the foot of the Blue Ridge Mountains. It has the finest water-powers of the State, which are slowly being utilized for manufacturing and electrical power for the cities around. The soil is naturally good and retains the improvement that is easily added by good farming. Its chief lack is farmers—men who will take up and make homes and improve the surplus lands, which as yet are low in price, but rapidly advancing.

THE CENTRAL SECTION.

This comprises the undulating country extending from the hills that mark the outline of the piedmont country proper to the falling off of the uplands to the level coastal plain. This is sometimes called the lower piedmont. In general character of soils it resembles the true piedmont country, but the soils are more generally sandy and gravelly over the red clay, though in many sections the same red clay forms the surface soil. From its lesser elevation the winter climate is slightly warmer than that of the upper piedmont section. On the southern end of this section we come to the great long-leaf pine belt, the sand-hill region, which, beginning in North Carolina, runs southwest through South Carolina, Georgia, Alabama, Mississippi, Louisiana, and into Texas, an extended region of sand-hills supposed to be the ancient dunes of the seacoast when the lower country was not elevated above the Atlantic. This was for generations regarded only for its product of turpentine and tar, and later for its lumber. But of late years it has grown into a region for winter resorts, at first by consumptives, who found the balmy air and dry soil favorable, and many of whom, finding that they could live in comfort there and could not do so in the North, settled permanently and built up the town of Southern Pines. Making homes there, these people naturally wanted to grow something. The deep sandy soil had always been considered too barren for any cultivation. But it was soon found that with proper fertilization the soil was admirably adapted to the production of fine grapes. Later on, large enterprises were started in the cultivation of peaches, and now immense vineyards and orchards are found in various sections, and their number is increasing, as the cultivation of the peach especially has been found profitable. Later on, the sand-hill country attracted the attention of Mr. Tufts of Boston, who assumed that the mild winter climate and

the pure water would make a resort for people who were simply tired and not sick. He therefore built the town of Pinehurst in the midst of thousands of acres of pines, and it has grown into a very popular winter resort, as consumptives are excluded. There are a number of hotels of different sizes and prices, and many cottages that are rented, and the visitors in winter now number thousands. At Pinehurst, too, out of the needs of the winter guests, there has been developed the fact that winter forcing greenhouses under glass could be made a very profitable part of the horticulture of this section. The surplus cucumbers from the Pinehurst forcing-houses have sold during the past winter in Raleigh at 15 cents each. With our abounding sunshine in winter, the forcing of vegetables and small fruits in hothouses can be made far more profitable than in the North, because of the greater sunshine and less amount of coal needed. Every gardener knows that sunshine under glass counts for far more than fire heat and costs less. In fact, the beginning made in frames by the gardeners of the eastern section in the winter culture of lettuce is but the entering wedge that will introduce regular winter forcing in North Carolina. The upper part of the central section has for generations been mainly devoted to the one crop of cotton, and, as a consequence of this clean and constant culture and shallow plowing, the hilly lands have washed badly and need protection by terrace banks, at least till by deeper plowing and subsoiling and the rotation of crops adapted to the increase of humus in the soil the inclination to wash is lessened. The soil is naturally easy to improve and to keep up if proper farming is done. Cotton and tobacco will always, probably, be the leading money crops of this section, though on some of the lighter soils the cultivation of watermelons for shipping is increasing. Fruits for home use can be easily grown, but the conditions outside the sand-hill country are not favorable to commercial fruit culture. But the climate favors the production of the finest forage crops in the form of cowpeas, soy beans, and alfalfa. Alfalfa has been very successful in this section, and its cultivation is rapidly extending. Few cattle have been kept in this section heretofore, but with the increase of forage crops there will naturally come more attention to stock. The markets in the towns and cities are not well supplied with butter of fine quality, and there is a constant demand for beef in the larger towns, a part of which has to be supplied from abroad, though as good beef can be grown here as anywhere, with the proper attention. The winter climate is peculiarly mild and less humid than that of the coastal plain. Occasionally the temperature in cold waves falls down in the teens above zero, but the mean winter temperature is far above the freezing point and zero is unknown. This section was originally covered with a vast forest of oaks, remnants of which are still found here and there in giant trees, especially in the capital city of Raleigh. But the second growth following the destruction of the original oak forest is largely of pine, which has been Nature's cure for man's waste. All the section north of the

sand-hills is well adapted to general farming with grain in rotation with peas and cotton; and with good farming there is no money crop in the United States that can compare in profit with cotton. Good farmers in this section can make a bale or more of cotton per acre, though the general average is much less. Northern men coming South are too apt to want to ignore the cotton crop, thinking that the deterioration of the soil has been due to the culture of cotton, when in fact there is no crop that makes a lighter demand on the soil when properly cultivated in a good rotation, and none that admits of a more rapid and profitable improvement of the soil through the growing of legumes and the feeding of live stock. In this climate the expensive barns of the North are not needed to protect cattle, for they can run out most of the time and find pasture, except in the coldest weather, and then open sheds furnish all that is needed. As has already been stated, on all the red-clay soil of the State the *Lespedeza striata*, known as Japan clover, has spread and furnishes an admirable summer pasture on lands otherwise waste. Mr. French, who came and settled in Rockingham County from the blue-grass pastures of Ohio, and has gone into the breeding of Polled Angus cattle with great success, stated recently in a public address that he found that the Japan clover gave him a better pasture than the blue-grass in Ohio, for it is at its best in the hot weather of summer when the blue-grass is parched and dried. With abundant summer pasture and the wonderful forage crops that can be grown for hay in the shape of cowpeas, vetch, and soy beans, it should be an easy matter to raise the finest of cattle in all the upland country of North Carolina. County after county in the piedmont section is being cleared of the fever ticks and being admitted north of the National quarantine line, and as this is done the raising of cattle for northern trade is becoming more profitable. For general grazing the grassy plateaus of the northwestern mountain section are equal to any in the whole country, and thousands of cattle of high grade are now raised there and sent west as feeders, the great elevation of the farms there precluding the profitable cultivation of corn. But in all the southern part of the mountain section the milder climate admits of wonderfully fine crops of corn, while the mountain balds furnish the summer pasture, and the markets southward for the finished cattle are inexhaustible.

THE COASTAL PLAIN.

This section extends westward from the seacoast for a hundred or more miles. It is a level and generally a sandy soil elevated but little above the sea and blessed with a winter climate of peculiar mildness from the proximity of the gulf stream, whose warm waters skirt the coast to Hatteras. In this section are found the great swamps or pocosons extending from the Great Dismal Swamp on the Virginia line to the southern extremity of the State. In this section cotton was for many years almost the sole crop, but in recent years the cultivation of tobacco has largely extended. The greatest development, however, as

we have seen, is in the great market-gardening industry that has sprung up and is rapidly growing both in the culture of vegetables and of small fruits, especially the strawberry. The Atlantic Coast Line Railroad and Norfolk Southern Railroad run through this section, and, with their branches, furnish rapid transportation for the perishable products of the gardens. With a climate that is below

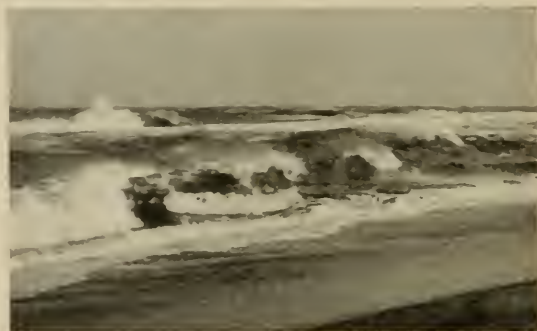


RED DRUM. THE LARGEST OF ONE DAY'S CATCH ON OUR COAST.

SECTIONS OF NORTH CAROLINA ARE A PARADISE FOR THE FISHERMAN AND HUNTER.

the freezing point in winter only occasionally, the work of the farm and garden can be carried on continuously, and with the intensive methods we have mentioned the winter cropping is becoming a feature of great importance. Where the lands adjacent to the great swamps have been drained they have been found of great fertility. In Hyde County many years ago the cutting of a canal from Lake Mattamuskeet to the Pamlico Sound opened up a body of land surpassing in

fertility the black prairies of the West, and all over this section there are bodies of black and fertile soil underlaid by a compact clay which makes them retentive of any improvement that is applied. In addition to the development in the market-gardening line, there has, in this section, grown up an allied industry which is unique in its way and found nowhere else in the country. This is the cultivation of flowering bulbs for the northern florists. It was found years ago that the soil and climate were peculiarly adapted to the production of the tube-rose bulbs. These are grown there to such perfection that a limited section along the Atlantic Coast Line, centering at the town of Magnolia, now supplies all the tube-rose bulbs for the northern and European markets. Of late years the tube-rose growers have turned their attention to other flowering bulbs and tubers, and there is a large acreage now devoted to the gladiolus, canna, caladium esculentum, dahlias, narcissus, and Roman hyacinth, and it is believed that the lily known as the Bermuda lily, and which is now imported in immense quantities from Bermuda, can be



SURF.

profitably produced there. Experiments in this line are in progress. Bulbs are also being produced on Roanoke Island, and the industry is extending. The level character of the soil of this whole section, the absence of rocks and hills and the generally light nature of the soil render cultivation easy, and, while there are poor and sandy soils, the general character of the soil is one of great natural fertility. On the moist black lands grass grows spontaneously and in great variety, and on the heavily manured lands of the trucking section wonderful volunteer crops of hay are made from the crab-grass after an early crop of vegetables has been shipped; and here, too, the cowpea, "the clover of the South," flourishes as it does nowhere else. Cattle winter without any care at all in the great swamps, feeding on the evergreen reeds of the canebrakes, and come out in the spring in good order and are soon ready for market. Many hundreds of the common scrub cattle of the section are thus pastured in winter, and with improved cattle and the abundant forage that can be grown there should grow up an export trade in cattle raised right near the ports from which they are shipped.

TEMPERATURE, PRECIPITATION, FROST.

IN THE following tables, prepared by the United States Weather Bureau, entries are made for selected stations and for the State.

The mean annual temperature for North Carolina is 58.9 degrees Fahrenheit. The lowest monthly mean is 40.7 in January; highest, 77.2 in July. The mean temperature in winter is 41.5, spring 55.3, summer 75.8, autumn 58.8. Considering the various parts of the State, there is a range in the annual mean from 48.2 at Linnville (elevation 3,800 feet) in the Blue Ridge Mountains to 63.3 at Beaufort on the southeastern coast. About half of this difference is confined to the mountainous region, the change becoming more gradual toward the coast. Zero temperatures occur annually in portions of the mountain district, but are seldom recorded east of the main ridge. The lowest record for the State is 19 below zero at Highlands, Macon County, on February 13, 1899. This was during the severe cold wave of record in the southern portion of the country. The lowest temperature at Asheville was 6 below zero, Charlotte 1 below, Raleigh 2 below, and Wilmington 5 above zero. The highest record of temperature is 107 at Chapel Hill on July 19, 1902.

The average annual precipitation is 50.58 inches. The greatest monthly amount is 6.19 in August; least, 2.54 in November. It is heaviest in the southern portion of the mountain district, especially in Macon, Transylvania, and Henderson counties.

The average date of the first killing frost in autumn ranges from September 30th at Linnville to December 8th at Beaufort; average date of last killing frost in spring, March 15th at Beaufort to May 3d at Linnville.

Additional data in detail will be furnished on application to Section Director, U. S. Weather Bureau, Raleigh, N. C.

MONTHLY AND ANNUAL MEAN TEMPERATURE.

STATIONS.	Elevation.	Length of Record—Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Asheville.....	2,255	32	35.4	38.5	44.9	53.9	62.6	68.7	71.7	70.5	65.0	55.3	45.1	37.8	54.1
Beaufort.....	10	8	48.3	46.7	53.8	59.7	69.5	75.7	80.0	79.9	76.1	65.2	56.2	48.6	63.3
Chapel Hill.....	500	25	38.9	43.0	49.2	58.8	68.0	75.6	78.7	77.0	71.5	59.9	49.9	42.2	59.5
Charlotte.....	773	30	40.4	44.1	50.8	59.2	68.4	75.5	78.7	76.6	70.7	61.1	50.4	42.9	59.9
Edenton.....	30	15	42.2	40.9	51.6	57.9	68.3	74.7	79.6	78.3	72.1	61.4	51.6	43.0	60.1
Greensboro.....	843	15	39.9	40.8	50.3	57.8	68.2	75.0	78.1	76.6	71.0	60.2	48.6	40.9	59.0
Henderson.....	490	15	39.4	38.2	50.6	56.5	67.9	74.5	78.1	77.2	72.1	59.7	49.5	40.7	58.7
Hendersonville....	2,167	13	36.4	37.5	46.2	53.3	63.7	69.9	72.3	72.5	65.9	55.9	46.5	38.6	54.9
Lenoir.....	1,186	28	36.9	41.0	46.4	56.2	64.8	71.5	75.0	73.7	66.7	56.5	46.0	38.6	56.1
Linville.....	3,800	13	30.6	30.0	40.3	45.9	57.4	63.2	65.9	65.1	59.3	48.6	40.1	32.6	48.2
Mount Airy.....	1,048	19	36.7	37.9	46.4	54.9	64.6	71.7	75.2	73.8	68.2	56.1	46.4	38.7	55.9
New Bern.....	12	25	45.5	45.8	53.9	59.6	69.2	76.0	79.0	78.2	73.6	62.8	54.1	46.7	62.0
Raleigh.....	390	22	40.4	43.3	50.4	59.0	68.1	75.1	78.5	76.8	70.6	60.5	50.2	42.7	59.9
Salem.....	1,000	15	37.5	38.3	49.8	56.6	67.9	73.5	77.6	76.7	70.8	57.7	48.0	38.9	57.8
Salisbury.....	760	23	41.0	41.8	51.1	59.7	69.1	75.7	79.0	77.5	71.7	59.3	50.5	42.4	59.9
Southern Pines....	519	18	43.4	44.8	54.4	61.3	71.0	77.2	79.4	78.6	73.9	62.2	53.0	45.6	62.1
Tarboro.....	50	23	41.6	42.3	51.5	59.0	69.4	76.4	79.9	78.6	72.9	61.1	51.1	43.0	60.9
Waynesville.....	2,756	15	37.2	36.6	48.6	52.2	62.2	67.9	70.4	70.2	64.7	53.5	45.7	38.4	54.0
Wilmington....	78	38	46.7	48.3	54.8	61.3	70.1	76.6	79.6	78.8	74.0	64.0	55.0	48.3	63.2
State (including all stations)			40.7	41.7	50.2	57.6	67.1	74.1	77.2	76.1	70.7	59.1	49.9	42.0	58.9

HIGHEST TEMPERATURE.

STATIONS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Asheville.....	72	74	86	84	90	90	91	89	88	82	74	70	91
Beaufort.....	73	71	83	83	87	92	96	92	93	87	75	73	96
Chapel Hill.....	80	76	92	97	98	104	107	105	102	92	85	78	107
Charlotte.....	77	79	91	94	97	102	102	100	99	92	80	76	102
Edenton.....	74	79	90	90	95	98	100	99	98	85	81	75	100
Greensboro.....	78	75	93	92	97	100	101	101	101	90	81	74	101
Henderson.....	77	74	92	98	98	100	101	104	103	92	80	74	104
Hendersonville....	74	73	88	85	93	94	95	95	94	84	79	75	95
Lenoir.....	72	74	83	88	96	97	98	96	93	87	83	76	98
Linville.....	61	63	75	79	83	83	89	85	82	74	67	60	89
Mount Airy.....	75	74	90	94	95	98	103	98	98	89	78	73	103
New Bern.....	80	80	92	92	99	100	100	100	100	90	86	78	100
Raleigh.....	79	80	94	95	98	102	103	99	100	89	82	75	103
Salem.....	78	73	91	98	96	98	100	101	101	90	77	73	101
Salisbury.....	79	75	92	94	100	101	102	102	100	94	85	75	102
Southern Pines....	84	81	100	101	101	103	106	106	103	93	83	80	106
Tarboro.....	81	76	96	97	99	104	105	105	106	93	87	79	106
Waynesville.....	76	69	89	86	90	92	92	93	90	83	80	74	93
Wilmington.....	80	80	94	90	97	100	103	99	96	92	83	78	103
State (including all stations)....	85	82	100	101	104	104	107	106	106	96	88	86	107

LOWEST TEMPERATURE.

STATIONS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Asheville.....	-1	-6	15	23	32	41	51	47	36	22	13	7	-6
Beaufort.....	15	13	30	32	43	56	60	62	50	40	27	20	13
Chapel Hill.....	-1	-6	13	26	29	41	52	52	35	26	13	6	-6
Charlotte.....	-1	1	14	26	37	45	55	53	38	30	18	-5	-5
Edenton.....	12	5	19	28	38	46	55	50	42	28	29	12	5
Greensboro.....	6	-3	14	26	33	45	54	52	40	26	17	7	-3
Henderson.....	4	-2	15	26	37	43	55	53	40	29	17	6	-2
Hendersonville....	-8	-9	5	20	29	41	47	44	33	20	12	-2	-9
Lenoir.....	-15	-8	8	19	35	42	51	49	32	28	12	-16	-16
Lenoir.....	-15	-16	-4	11	26	33	38	37	27	14	0	-7	-16
Mount Airy.....	-15	-4	8	19	28	40	47	44	34	20	10	2	-15
New Bern.....	6	2	17	27	36	49	54	53	42	28	16	12	2
Raleigh.....	2	-2	16	28	38	46	54	52	39	31	17	9	-2
Salem.....	3	0	9	26	31	45	49	49	38	24	14	2	0
Salisbury.....	6	-1	16	20	30	41	54	45	41	23	12	6	-1
Southern Pine.....	6	-4	15	25	37	48	50	52	40	25	13	5	-4
Tarboro.....	-1	-2	13	26	34	46	48	52	36	27	16	2	-2
Waynesville.....	-12	-10	2	15	30	34	45	45	29	16	9	-4	-12
Wilmington.....	9	5	20	28	38	51	58	56	42	32	20	10	5
State (including all stations)....	-18	-19	-7	6	22	30	38	36	27	11	0	-16	-19

MONTHLY AND ANNUAL AVERAGE PRECIPITATION.

STATIONS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Asheville.....	4.67	4.56	5.08	4.04	3.78	4.35	4.86	4.79	3.04	2.94	3.30	4.06	49.56
Beaufort.....	4.07	4.50	4.97	4.26	4.22	4.17	5.46	6.20	4.25	6.40	2.74	4.66	55.90
Chapel Hill.....	3.82	4.12	4.51	3.85	4.52	3.75	4.88	5.25	3.54	3.25	2.78	3.81	48.08
Charlotte.....	4.06	4.37	4.41	3.53	3.89	4.32	5.16	5.89	3.28	3.13	2.89	3.84	48.83
Edenton.....	3.52	4.69	4.24	3.26	4.98	4.24	6.97	6.12	3.31	4.43	2.85	3.56	52.17
Greensboro.....	3.14	4.57	4.49	3.32	4.39	5.27	5.11	5.34	2.97	2.91	2.67	3.41	47.59
Henderson.....	3.27	4.82	4.70	4.05	4.08	4.36	5.72	6.45	3.53	3.25	2.68	3.91	50.82
Hendersonville....	4.83	6.03	6.35	4.18	4.57	6.25	6.20	7.91	4.00	4.09	2.92	5.63	62.96
Lenoir.....	4.01	4.29	4.43	3.56	4.58	4.72	5.50	5.89	4.40	3.32	3.03	4.05	51.78
Linville.....	3.49	4.91	5.72	4.25	4.44	5.61	6.91	5.15	5.69	5.02	3.52	5.52	60.23
Mount Airy.....	3.27	3.89	4.02	3.17	3.53	4.85	5.78	6.10	3.77	2.69	2.63	3.56	47.26
New Bern.....	4.09	4.21	4.13	3.56	4.76	5.40	7.64	7.91	4.92	3.81	2.93	3.70	57.06
Raleigh.....	3.12	4.24	4.19	3.41	4.57	4.57	5.43	6.14	3.71	3.12	2.42	3.18	48.10
Salem.....	3.26	4.82	4.63	3.11	3.63	5.02	5.61	5.51	2.97	2.68	2.56	3.98	47.78
Salisbury.....	3.46	4.25	4.56	3.29	4.28	4.57	5.04	5.33	3.20	3.25	2.63	3.75	47.61
Southern Pines....	3.48	4.58	4.21	3.57	4.32	5.13	7.73	7.01	3.41	3.22	2.75	3.61	53.02
Tarboro.....	3.89	4.15	3.92	3.20	4.89	4.25	6.35	6.73	3.47	3.59	2.55	3.75	50.77
Waynesville.....	4.19	4.40	5.71	3.85	3.88	4.30	4.83	4.42	2.64	2.38	2.49	3.81	46.90
Wilmington.....	3.48	3.43	3.58	2.74	3.98	5.65	6.81	6.95	5.10	3.76	2.31	3.08	50.88
State (including all stations)....	3.52	4.49	4.22	3.41	4.47	4.98	5.94	6.19	3.78	3.44	2.54	3.60	50.58

DATE OF KILLING FROST.

STATIONS.	Average Date of First Killing Frost in Autumn.		Average Date of Last Killing Frost in Spring.		Earliest Date of Killing Frost in Autumn.		Latest Date of Killing Frost in Spring.	
Asheville.....	October	13	April	20	October	3	May	10
Beaufort.....	December	8	March	15	November	25	April	15
Chapel Hill.....	October	13	April	8	October	1	April	21
Charlotte.....	November	4	March	29	October	8	April	26
Edenton.....	November	2	April	3	October	12	April	26
Greensboro.....	October	25	April	7	October	11	April	18
Henderson.....	October	31	April	7	October	10	April	24
Hendersonville.....	October	13	April	27	September	29	May	15
Lenoir.....	October	18	April	18	October	1	May	7
Linville.....	September	30	May	3	September	14	May	27
Mount Airy.....	October	15	April	20	October	1	April	30
New Bern.....	November	7	April	5	October	10	April	24
Raleigh.....	November	3	April	4	October	8	May	6
Salem.....	October	17	April	21	October	11	May	10
Salisbury.....	October	21	April	9	October	3	May	15
Southern Pines.....	October	30	April	7	October	11	April	21
Tarboro.....	October	25	April	11	October	10	April	30
Waynesville.....	October	10	April	10	September	28	May	14
Wilmington.....	November	15	March	27	October	16	May	1

NORTH CAROLINA THERMAL BELTS.

The Great Fruit and Vegetable Zones!—High, Dry, Healthful Region.

MORE than forty years ago Silas McDowell wrote in the Agricultural volume of the Patent Office Report an article relating his observations in Macon County. He was a man of much intelligence, and had been in youth a companion of John Lyon, the English botanist, exploring with him the Black, Yellow, Roan, Grandfather, and Linville ranges, and caring for him until his death in 1814.

Mr. McDowell was also a companion of Curtis, Buckley, Reinhardt, and Dow, the latter of whom perished among the mountains, and his remains were never discovered. Dr. Gray was in communication with him more than forty years ago. He wrote:

"When I commenced business it was as a farmer in western North Carolina, in a wild valley and amid lofty mountains, and for nearly fifty years my house was an open, free home to the scientist, particularly the geologist and botanist (my own specialties). But now the light begins to burn dim in the binnacle, and is nearly out."

He died in 1882, at the ripe old age of 87. Honor to his memory!

A description of the phenomena observed by him is given in his own words:

"Among the valleys of the southern Alleghanies sometimes winter is succeeded by warm weather, which, continuing through the months of March and April, brings out vegetation rapidly and clothes the forest in an early verdure.

"This pleasant spring weather is terminated by a few days' rain, and the clearing up is followed by cold, raking winds from the northwest, leaving the atmosphere of a pure indigo tint, through which wink bright stars: but, if the wind subsides at night, the succeeding morning shows a heavy hoar frost; vegetation is utterly killed, including all manner of fruit germs, and the landscape clothed in verdure the day before now looks dark and dreary.

"It is under precisely this condition of things that the beautiful phenomenon of the 'Verdant Zone' or 'Thermal Belt' exhibits itself upon our mountain-sides, commencing at about 300 feet vertical height above the valleys, and traversing them in a perfectly horizontal line throughout their entire length, like a vast green ribbon upon a black ground.

"Its breadth is 400 feet vertical height, and from that wider, according to the degree of the angle of the mountain with the plane of the horizon. Vegetation of all kinds within the limits of this zone is untouched by frost; and such is its protective influence that the Isabella, the most tender of all our native grapes, has not failed to produce abundant crops in twenty-six consecutive years; nor has fruit of any kind ever been known within these limits to be frost-killed, though there have been instances where it has been so from a severe freeze. The lines are sometimes so sharply drawn that one-half of a shrub may be frost-killed while the other half is unaffected.

"This belt varies in the height of its range above different valleys. I will name a case in point. I made my observations in relation to this belt in Macon County, which is traversed by the beautiful valley of the Little Tennessee River lying 2,000 feet above tidewater. Here, when the thermometer is down to 26° the frost reaches 300 feet vertical height. A small river, having its sources in a high plateau 1,900 feet above this, runs down into this valley,

breaking through three mountain barriers, and consequently making three short valleys, including the plateau, rising one above the other, each of which has its own vernal zone, traversing the hillsides that inclose them, the first of which takes a much lower range than that of the lower valley, and each taking a lower as the valleys mount higher in the atmosphere, and in the highest one the range of the belt is not more than 100 feet above the common level of the plateau, a beautiful level height containing 6,000 acres of land and lying 3,900 feet above tidewater.

"The country on the Atlantic side of the Blue Ridge sinks rapidly by a succession of long sunny slopes reaching down into the plain or level country. Along these slopes the air is pure and dry, a refuge for the consumptive, as diseases of the lungs have never yet been known to originate among the inhabitants of these dry, fogless mountains; and here also does the grape find a most salubrious climate and congenial home."

Another similar belt is found along the eastern slope of the Tryon Mountain range in Polk County.

Said Dr. L. R. McAbey of Linn, in this county:

"The belt along Tryon Mountain is some 8 miles long and extends from 1,200 feet above tidewater to 2,200 feet, thus being about 1,000 feet in width. This begins at the very base of the mountain, and extends up till you have attained the full height of the Blue Ridge, say of Asheville, Buncombe County, with an elevation where the belt is most perfect of about 1,500 feet.

"The observed facts of temperature are truly strange. The mercury falls in summer and rises in winter, when compared with either the top or the base of the mountain, so much so that travelers on the highway through the belt perceive the difference without the aid of a thermometer. This difference is greater at night than during the daytime, being 5° to 10° on the summer nights, and 15° to 20° on winter nights. There is very little dew, generally none perceptible, which accounts for little or no frost.

"The flora is grand. The azalea there, instead of being a shrub 4 feet high, attains a height of 10 to 20 feet, and exhibits every shade of pink and orange.

"We are in latitude 35° , but for all practical purposes, 3° south of our geographical position. The leaves of plants, shrubs, and flowers remain untouched by frost until the latter part of December, and sometimes till the middle of January, when they are killed by snow or sleet. The early spring in the belt admits of planting any vegetables the first of February without risk from frost. Tomatoes, tobacco, and other tender plants remain green until after the middle of December. Fig trees live through the winter unprotected, and bear full crops, while in the valley they are killed to the ground every winter. Grapes never mildew nor rot, and are of large size and delicious flavor. This belt is confined within distinct and well-defined limits, which remain the same from year to year, and in the middle stratum of air or land on the mountain-side."

Another writer says:

"After a snowstorm not a particle of snow will exist in the belt (it melts as it falls), while the tops and sides of the mountains above, and the valleys below, will be covered."

Prof. John Le Conte said:

"I wish to put on record the results of observations made by me many years ago on the 'frostless zones' of the flanks of the mountain spurs adjacent to the valleys in the Blue Ridge. My observations were made at Flat Rock, near Hendersonville, Henderson County, a well-watered, fertile, mountain plateau-like valley, which is about 2,200 feet above the sea level.

"My own observations, and the information elicited from residents, seem to indicate the following facts: The zones in question are not exempt from frost during the whole of the cold season; in fact, during the winter the ground in these belts is frequently frozen to a considerable depth, but during the spring months they are conspicuously and uniformly frostless."

It seems, then, to be an established fact that, at these three points, in three different counties, there are some noteworthy meteorological conditions prevailing along this belt of 400 to 1,000 feet of perpendicular height, and it seems probable that a similar state of things exists in kind, if not in degree, on all the southern and eastern slopes of parallel mountain ranges in that latitude where protected against wind.

Respecting the explanation of these phenomena, Mr. McDowell theorizes as follows:

"Heat is ever radiating from the earth, and in cold, clear, still nights it mounts upward through the cold, damp air, taking from it its caloric, while the latter rushes down in a cold, frost-producing current, and hence the lowest ground in a valley is ever subject to the hardest frosts.

"The warm, dry, light current keeps mounting upward like cork in the water, until it reaches a stratum of atmosphere too thin and light to support it, when it consequently falls back and pours its warm, dry, genial stratum upon the top of the lower or frost stratum; and hence, on cold, frosty nights, is produced the phenomenon of the 'Vernal Zone.'"

Of course such a phenomenon must be explained in general upon the theory of the nocturnal stratification of layers of the atmosphere, having different amounts of moisture and caloric, of which we so often see examples when the mist settles in the valleys at a given level, which, if the temperature be sufficiently low, would also be the frost line, or when often, on a summer's day, from a mountain-top the white cumuli may be seen stretching away in long lines at a well-defined altitude. But in these cases we have no such visible and exact demarcation of the warmer stratum on its upper side.

Professor Le Conte, already quoted, says:

"The 'frostless zones' coincide with the nocturnal and morning 'fog belts' of the spring months. The uniform pressure of these white circumscribed belts of fog on the flanks of the mountain spurs during the early morning hours imparts a striking feature to the scenery of these valleys. When illuminated by the bright morning sun they appear like girdles of cotton-wool of moderate width, encircling the peaks at the height of 200 or 300 feet above the adjacent valleys; and their cumulus-like whiteness, contrasted with the verdure above and below them, is no less striking than it is beautiful."

The latter circumstance seems to furnish an explanation of the physical cause of the so-called "Thermal Belt"; for the constant fogs at night and in the morning not only prevent refrigeration by obstructing terrestrial radiation, but, during the condensation of vapor in the process of fog formation, there must be developed an enormous amount of heat just at this zone. Why this condensation of aqueous vapor should be so persistently restricted to a belt of only a few hundred feet in vertical thickness is a question much more difficult to answer. The

observations of intelligent residents of the mountain valleys in the southern divisions of the Appalachian chain will doubtless verify or disprove the general *coincidence* of the "frostless zone" with the "fog belt."

This piedmont region, not merely that section technically so-called, but the zone along and around the southern Appalachians having an elevation from 1,000 to 2,500 feet above sea level, possesses attractions as regards beauty and grandeur of scenery, fertility, and variety of soil, equability and salubrity of climate, not to be surpassed in the Union.

If, in addition, these thermal belts exist and extend generally among those ranges, offering exemption from certain forms of disease, with exceptionally favorable facilities for fruit culture, a knowledge of the facts should be more generally diffused.

These facts point out this region as the best place to be found for the cultivation of celery, cauliflower, tomatoes, and other vegetables for canning; raspberries and strawberries for shipment and preserving; for peaches, pears, fine apples, cherries, quinces, and currants; also, for the finer table and wine grapes. All of these are known to flourish in the mountains, and are distinguished for crispness, flavor, and color. Irish potatoes, pumpkins, turnips, beets, parsnips, carrots, and the like also grow to perfection.



GRASS GROWS TO THE
VERY TOP OF
THE MOUNTAINS IN
NORTH CAROLINA.



